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MODERN TREATMENT

OF

TONSILS and ADENOIDS.

A Thesis for the M.D. Edinburgh.

by

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Introduction.

There is no condition, especially of those affecting children which is of so much practical importance as that form of hypertrophy of the faucial tonsils and of the lymphoid tissue in the postuasal space which is familiarly spoken of as Enlarged Tonsils and Adenoids. That the disease is very widely spread is easily proved by a glance at the latest Annual Report of the Chief Medical Inspector of the Board of Education, in which the statistics of the school children in various districts throughout England are recorded, and in some of these the percentage of cases suffering from enlarged tonsils or adenoids or both is as high as 16·99. In Macclesfield alone among the school children examined during the years 1908, 1909, and 1910, 14 per cent. were found to be afflicted with this condition.

Regarded merely from a pathological standpoint this affection may be characterised as trifling but so numerous and varied are its after effects, and the

consequences of neglect so detrimental to the health and future prospects of the sufferer that it may be justly considered one of the most serious disabilities to which the child of the present day is liable. In order to indicate the vital importance of adequate

treatment it is only necessary to point out that nasal catarrh, mouth breathing, deafness and discharge from the ear, susceptibility to infectious disease, e.g. tuberculosis, lowered physical and mental vitality, dullness, impairment of the general nutrition and physique, predisposition to chest affections, and deformity of the nasal passages and of the chest are among the varied conditions which directly or indirectly may arise from enlarged tonsils and adenoids.

That the methods of treatment frequently adopted, e.g. tonsillotomy, are far from adequate is readily seen from the fact that so frequently in these cases a recurrence of the symptoms renders a fresh operation on one or more occasions necessary. Within the last few years therefore, surgeons have adopted the practice of enucleation of the tonsil either by means of the finger or by various cutting methods as they have come to recognise that tonsillotomy leaves the diseased crypts behind for the most part, and that the tendency of these is to keep up the symptoms.

The scope of the present thesis is to outline briefly the anatomy, physiology and pathology of the tonsils and to give an account of the present day views on the subject of treatment adding a few personal clinical experiences of the condition as one meets in private practice.

Historical Outline.

The history of the pathological conditions of the tonsil and their treatment is almost as old as that of medicine itself, for Celsus who flourished at the beginning of the Christian Era, and whose writings are perhaps the most popular and widely read of all the medical classics, describes in his De Medicina, Cap. VII. the condition and its treatment by finger enucleation or excision, speaking of it with such familiarity that it is very evident that the condition was well known at that time.

He observes: "Tonsils which remain indurated after inflammation if covered by their membrane, should be loosened by working the finger round them, and then torn out; when this is not practicable they should be seized with a hook and excised by a scalpel."

The next writer on this subject is found nearly 500 years later, i.e. Aetius, A.D. 490, and he speaks of the operation much more cautiously than does Celsus; for he says: "The portion of the tonsil which projects, e.g. about half the enlarged gland, may be removed. Those who extirpate the entire tonsil remove at the same time tissue structures which are perfectly healthy and in this way give rise to serious haemorrhage."

Paulus Aegineta, A.D. 750 (New Sydenham Soc.

Translations, Vol. II. p. 297) in dealing with this subject, states that he does not approve of operating on the tonsils when inflamed but when they are "white contracted and have a narrow base." He gives precise instructions as to the method to be adopted, the head of the patient being held, the tongue depressed and the tonsil seized by a tenaculum and "cut out by the root."

Albucasis, A.D. 1120 ("Al-Tasriff, Oxford, 1778, Cap. II. Sec. 38) is evidently greatly influenced by the teachings ofPaul of Aegina as he gives practically the same directions in carrying out the operation. The spirit of caution is, however, beginning to manifest itself at this period and he is in dread of haemorrhage and fears to encise the tonsils except when they are "found whitish and have a narrow base."

Subsequently to this period although the subject of hypertrophy and other diseased conditions of the tonsils is frequently mentioned, the operation for their removal appears to have fallen into disuse and become obsolete and traditionary so that subsequent writers either omit all mention or only mention it with such caution that it is clear they had no personal experience of it.

Thus Ambrose Pare, 1509 (Oeuvres Completes, Edit. Malgaigas, Paris, 1840, p.383) advises tracheotomy when there is serious hypertrophy of the tonsils,

also alluding to the ligature of the enlarged glands but ignoring the treatment by excision.

Again, Fabricius of Aquapendente, 1540 ("Opera Chirurgica," Lugdini Bartovorum, 1723, col. 461-2), comments upon the instructions of Celsus and Paul of Aegina and arrives at the following childish conclusion: "Whence we can perceive that this surgical procedure is neither easy nor altogether safe."

"Wishing to avoid all violence in this operation we should advise that a trial should be first made to loosen the tonsil from the surrounding tissues with avectis, and then having laid hold of it with a very slender volsellum, to pull it outwards in order that the gland may come away of its own accord."

Guillemeau (Les Oeuvres de Chirurgie de Jacques Guillemeau, Paris, 1612, p. 688), the pupil of Ambroise Pare, takes a bolder line than his master and does not resort to tracheotomy unless the patient's mouth cannot be opened. According to circumstances he ligatured or cut away the diseased masses but disapproved of the removal of the entire tonsil.

In 1637 Severini (Saint Geomain, Dist. de med. et de Chir. Prat. Paris, 1865, Vol. II. p. 156), during the course of an epidemic at Naples, the principal symptom of which was great swelling of the tonsils, removed the greater part of the glands if sessile by means of caustics, and when pedunculated with the aid of a hook and a sort of semicircular knife.

Notwithstanding this, for a whole century afterwards excision of the tonsils was discountenanced, although some few surgeons occasionally had recourse to the ligature.

Dionis, 1672 (Cours l'operations de Chirurgie, Paris, 1714, p. 532) is altogether opposed to the removal of tonsils whether by excision, avulsion, or ligature, stating that the physiological importance possessed by the glands is such as to preclude the advisability of wholly or partially taking them away.

Innker, 1680 (conspectus Chirurgiae taur Medicae quam Instrumentalis, Halle, 1721, p. 661), Heister, 1683 (A general system of Surgery, London, 1758, Vol. II. p. 44) and Sharp, 1688 (Surgical Operations, London, 1761, p. 189, 8th edition) are all afraid to excise the tonsils and condemn the operation of removing only portions of the gland by ligature or cautery.

It is perhaps worth quoting the opinion of Heister as his surgical treatise was probably the most popular textbook during the first half of the 18th century: "This operation is not only too severe and cruel, but also too difficult in the performance, to come into the practice of the moderns, because of the obscure situation of the tonsils."

After 1740, however, the operation by means of the tenaculum and bistoury was again much practised, the credit of its revival being principally due to

Mesati (Mem. de l'academie de Chir. "Sur le ressession des amygdales tumifieres) and Wiseman (Eight Chirurgical Treatises, London, 1734, Vol. II. p. 30, 6th Edition) the latter of whom first ligatured the tonsil and then cut off the projecting portion.

In 1757 Caque began to excise tonsils at the Hotel Dieu de Rheims proving beyond doubt that the great dread of haemorrhage was chimerical and that the resulting wound readily healed in a short time.

From this date the operation became fully recognised and practitioners set themselves to improve the instruments required and also the technique, that most generally favoured being the method of Louis who made use of a blunt-pointed bistoury and a pair of scissors with either curved or straight blades :

The patient having been set with the face towards the light and told to open his mouth, an assistant pressed down the tongue with his finger or a spatula, while the surgeon seized the tonsil with a volsellum, and drawing it as much as possible towards the middle line cut off the superfluous portion on a level with the pillars of the fauces.

Until the year 1828, the literature of the subject concerned itself almost entirely with treatment, but in that year Dupuytren (Report. d'Anat. et de Physiolog. 1828) drew attention to the association of chest deformities with enlargement of the tonsils.

He noted "a lateral depression of the parietes of the chest, consisting of a depression, more or less great, of the ribs on each side, and a proportionate protrusion of the sternum in front."

In 1838, Ineason Warren (Philadelphia Medical Examiner, May 1838) fully investigated the subject of the constitutional symptoms and thoracic deformities induced by enlarged tonsils, and in 1854, Chassaignac published his classical work "Lecous sur l'Hypertrophie des Amygdales" in which he describes the various ill-effects resulting from tonsillar enlargement.

This was followed in 1861 by a memoir by Lambroir (Bulletin de l'Acad. de Med. 1861), who came to the conclusion that the thoracic deformities observed were the result of the constant energetic contractions of the diaphragm in its efforts to overcome the obstacle to free respiration.

In these treatises are embodies the most important contributions to our knowledge of this subject though mention should be made of the attempt by Borelli in 1861 to reintroduce to the notice of the profession the subject of enucleation of the tonsil by means of the finger and scissors.

Within the last few years this method of dealing with enlarged tonsils has been extensively practised in America and a great impetus has been given

to the subject in this country by the publication by G. Seccombe Hett (B.M.J., Nov. 19th, 1910, p. 1621) of his investigations into the anatomy of the capsule of the tonsil and its significance in the treatment by enucleation.

The recognition of the hypertrophy of the nasopharyngeal adenoid tissue as a separate pathological entity unlike that of diseased conditions of the tonsils is of comparatively recent date, the first observer to point out the clinical importance of the condition being the late Prof. Wilhelm Meyer of Copenhagen (Hospitals Tidende, Copenhagen, Nov. 1868), who fully described the symptoms and progress of the affection which he termed:- Adenoids - its microscopic characteristics and its treatment surgically. He also shewed that the disease was far from being a new one, drawing attention to old busts, portraits and statues which typically illustrate the condition.

In the same year the situation and the structure of the pharyngeal tonsil was carefully described by Luschka and it is from this circumstance that it is frequently termed Luschka's Tonsil (Der Schlundkoff des Menschen).

In 1889 Dr. Guye of Amsterdam (B.M.J., Vol. II. 1889, p. 709), drew attention to a condition often associated with adenoids and termed by him 'aprosexia'

or 'an inability on the part of the sufferer to fix the attention on any definite more or less abstract subject.'

Following the publication of the investigations a variety of methods of treatment were devised, including chemical caustics, the electric cautery and respiratory exercises; all the earlier methods, however, have now been discarded, and modern practitioners in the treatment of this condition always aim at the complete removal of the vegetation by operation.

A large number of instruments have been designed for this purpose, and in this as in other operations each surgeon no doubt works best with the instrument he habitually uses.

Anatomy, Physiology (including Histology) of the Normal Tonsil.

There are three masses of lymphoid tissue to be found in the walls of the pharyngeal cavity, to which the term tonsil is applied. These are as follows :

(a) The Tonsil.

(b) The Pharyngeal Tonsil.

(c) The Lingual Tonsil.

(a) The Tonsil lies in the naso-pharynx and is situated between the anterior and posterior pillars of the Fauces. It is rounded in form and varies considerably in size in different individuals, being more marked in children than in adults. In the living subject it is readily seen protruding from the Isthmus of the Fauces. It is a reddish fleshy mass, nodular or crenated in appearance and presents elevations or depressions on its surface.

Relationships. - Anteriorly the Tonsil is related to the Anterior Pillar of the Fauces by which it is separated from the cavity of the mouth. The Anterior pillar is formed by the Palato-glossus muscle covered by mucous membrane. Posteriorly the Tonsil is in relation with the posterior pillar of the fauces which is formed by the palato-pharyngeal muscle.

Internally it projects into the Isthmus of the Fauces, and occasionally is covered, especially in the child, by a fold of mucous membrane known as the Plica Triangularis, the apex of which is attached to the anterior pillar, and spreads out to be lost on the surface of the tonsil.

Externally the Tonsil is in relation with the inner surface of the Superior Constrictor Muscle of the Pharynx, separated from it by a little loose areolar and mucous tissue. External to the Superior Constrictor is the Ascending Palatine Branch of the Facial Artery, and outside this the internal pterygoid muscle separating it from the ramus of the lower jaw. To some extent also the stylopharyngeus and the styloglossus as they pass from the styloid process to the pharynx and the tongue are external relations of the tonsil while fully an inch away and behind is the Internal Carotid Artery.

Above the Tonsil is the supratonsillar recess as described by His.

Blood Supply. The Tonsil receives its blood supply from

1. The Ascending Palatine Branch of the Facial.
2. The Tonsillitic Branch of the Facial.
3. The Descending Palatine from the Internal Maxillary.

4. The Dorsalis Linguae from the Lingual.

5. The ascending Pharyngeal from the External Carotid.

Of these the largest are the branches from the Facial which enter the capsule after piercing the Superior Constrictor Muscle.

The Capsule of the Tonsil closely invests that portion of the gland which is embedded between the pillars of the fauces. The supratonsillar fossa is included within it. Towards the side of the tongue the capsule blends with the connective tissue which surrounds the lymphoid tissue in this situation and it is to these bilateral prolongations that the name of lingual tonsil is applied.

The Pharyngeal or Luschka's Tonsil is situated in the roof of the nasopharynx between the openings of the Eustachian tubes with which it may come into relationship when enlarged. It is a distinct collection of lymphoid nodules in relation with the roof and lateral recesses of the nasopharynx and is especially well marked in children.

Histology.

The Tonsils consist of masses of lymphoid tissue covered on their free surface by the stratified epithelium of the mucous membrane which is fitted by apertures leading into recesses or crypts in the sub-

stance of the gland. These crypts are lined by a prolongation of the stratified epithelium and into them the ducts of numerous small mucous glands open. The tonsils are chiefly composed of lymphoid tissue, which is here and there collected into small nodules with the lymph cells more closely arranged than elsewhere. In these nodules active proliferation of the lymph cells takes place and on this account they are sometimes termed germ centres. The lymph corpuscles infiltrate even the epithelium and are also to be found on the free surface where they mingle with the saliva. These lymphoid corpuscles are contained in a delicate network of fibrous tissue which is present on the outer or attached surface of the tonsil in such amount as to form a distinct capsule down to which the crypts extend.

In the case of the pharyngeal tonsil there are no crypts, otherwise it resembles that of the Fauces. The mass is covered by ciliated epithelium and the surface is more or less lobular, the mucous membrane especially in the child being folded. There is very little connective tissue but the tonsil is extremely vascular.

Physiology.

There is still some considerable uncertainty surrounding the Physiology of the Tonsils, and some

observers still oppose their total extirpation on the ground that they fulfil some yet unrecognised function. The general view, however, is to regard the Tonsil as a modified lymph gland which to some extent protects the body from the invasion of pathogenic organisms which have found entrance by way of the mouth or nose. The fissures or crypts form traps for the organisms, leucocytes readily passing out through the spaces existing between the epithelial cells and thus checking the activities of the invading microbes. It can be readily imagined however, that these gaps may play a double part and where the vitality and resisting powers are lowered, they may form an easy means of entrance into the system of pathogenic organisms.

The function therefore of the Tonsil, which in common with the rest of the adenoid tissue throughout the body forms a breeding ground for lymphocytes, is normally one of defence against bacterial invasion. but with a great tendency to offer such feeble resistance that the attack succeeds.

Pathology.

Two varieties of enlargement of the Tonsils are to be noted. The first which is a true hypertrophy of all the constituents of the gland is especially seen in young children, in whom there is a large soft friable tonsil where all the lymphoid elements are involved without any great increase of the stroma. The lymphatic nodules are increased in size and number. The lacunae are dilated, their walls thickened, and the cavities filled with a viscid fluid secreted by the mucous membrane.

In the other variety there is a great increase of the fibrous tissue elements and this form is especially characteristic of hypertrophy of the tonsil as seen in adults. As a consequence of the excessive growth of the fibrous tissue elements the lymphatic nodules and blood vessels are compressed and atrophied. The crypts are also obliterated and the tonsil becomes hard, small, and firm.

In the case of hypertrophy of the pharyngeal tonsil the growths vary in size from a pea to an almond. In structure they are very similar to the faucial tonsil but are more highly vascular and there is a relatively smaller amount of fibrous tissue. Both forms of tonsil are of interest pathologically from the fact now well established that they very frequently form the portal of entry of Tubercle Bacilli

into the system. Milligan who has studied this question found that 15% of the cases he examined shewed the presence of tubercle while Scott Carmichael had practically the same result, 7 cases being infected out of 50 cases of tuberculous glands of the neck.

Etiology of Increased Growth of Adenoid Tissue.

Adenoids and Enlarged Tonsils are manifestations of one process, namely: an overgrowth of the normal lymphoid tissue and they arise from the same causes. Occasionally they are congenital and they are to be seen within a few days of birth. Heredity plays a considerable part in their causation and several members in one family are frequently found to be subject to the condition. Not very long ago I operated on twin boys who suffered from enlarged tonsils and adenoids. It is probable, however, that heredity plays a more or less indirect part in bringing about the condition by transmitting a strumous diathesis in which there is a marked tendency for lymphatic glands to hypertrophy and degenerate. Sometimes the increased growth of adenoid tissue is associated with a general hypertrophy of all the lymphoid tissues of the body - Lymphatism - a fact to be carefully borne in mind by operators.

The disease is most frequently seen in children between the ages of 5 and 15. After puberty there is a tendency for the tissues to atrophy. A cold, damp

climate predisposes to the condition, and Osler has observed that it is much more prevalent in this country than in any other. It is a disease of civilisation being practically unknown among the primitive races. The enlargement may follow any of the eruptive fevers or diphtheria, and a common cold or influenza act apparently as exciting causes of the disease. At the same time it should be pointed out that the presence of this adenoid tissue greatly increases the risk of these various infectious diseases and also of acute bronchitis. There is a marked relationship between hypertrophied tonsils and the rheumatism of children and the condition is frequently associated with a septic state of the mouth due to defective and carious teeth. The condition may also result from repeated acute inflammatory attacks.

From the above it is obvious that no single condition can be put down as the cause of this overgrowth of adenoid tissue and it is more than probable that a combination of several of these causes working together may be responsible for the condition.

Treatment: Importance of, and Effects of Neglect.

It is hardly necessary at the present day to dwell at length on the importance of thorough treatment of hypertrophied tonsils and adenoids; indeed there is perhaps too much zeal displayed in the operative warfare which is being waged indiscriminately on this condition altogether, apart from the question of whether it is giving rise to symptoms or not. Given however, a case of enlarged tonsils and adenoids in which there are any of the signs of those ill effects which we have seen may arise from their presence it is our duty to have recourse to operative measures at once. The benefits to be derived from operation should be pointed out to the parent of a child so afflicted, and also that if neglected, the condition may lead to much mental and physical impairment. Operative interference is followed in the great majority of cases by such immediate relief that a child who has hitherto been dull and listless, always liable to cold and bronchitis, often suffering from deafness, an easy victim to infectious disease improves beyond all knowledge in a very short space of time.

If the condition is neglected we may find that it proves such an obstacle to the mental and physical welfare of the sufferer as to become a lifelong handicap.

An
~~The third~~ objection raised is that there is a possibility of damaging the pillars of the Fauces, thereby injuring the voice. The risk of this accident can be avoided to a large extent by the use of good illumination and the exercise of care in the dissection. At the same time injury to the faucial pillars is not regarded as likely to give rise to such serious results to the singer as some try to make out.

In the cases where adenoids are present as well they should be removed at the same time as the hypertrophied tonsil, by means of an adenoid curette introduced into the nasopharynx in the middle line, the adenoid mass being cut away from its attachment by a firm, sweeping movement. Any tags left may be dealt with by means of a ring knife.

In young children it is important to remember that the pharyngeal tonsil is in its most active period of growth and it is essential that the operation should be thoroughly carried out if it is to prove effective.

My personal experience of the enucleation began some ten years ago and may be briefly related and illustrated by means of the following cases.

Case 1.

This was in a female aet. 30, who had for a great many years suffered from recurrent attacks of acute tonsillitis accompanied by peritonsillar abscess, for which she had already undergone tonsillotomy without relief. Enucleation of the tonsils was therefore performed under a general anaesthetic and was followed by complete relief from the attacks of quinsy.

Case II.

Shortly after the case noted above I was consulted regarding a child, aged 8 years, who suffered in a marked degree from enlarged tonsils and adenoids. She had the characteristic open mouth and vacant expression and was suffering constantly from colds in the head which frequently ended in acute attacks of bronchitis. She often complained of ear-ache and was beginning to be slightly deaf. The tonsils were enlarged but were deeply embedded and projected only slightly beyond the pillars of the fauces. As similar cases treated by means of the guillotine had proved unsuccessful in my hands I resolved to adopt a more drastic method in this case. I therefore freely

separated the tonsils from the faucial pillars by means of a flat, blunt dissector slightly curved. The tonsil could thus be separated from its bed and pushed into the fenestrum of a tonsillotome by means of which the operation was completed. This practically constituted an enucleation the greater portion of the tonsil being removed complete in its capsule. This treatment, together with a thorough curetting of the post-pharyngeal space proved eminently satisfactory and the child as a consequence improved in a most astounding manner, all her symptoms at once disappearing, and a marked change soon being noted in both her mental and physical development. So impressed was I with this result that I have adopted this method almost as a routine ever since, the results proving so very much more satisfactory than when only a section of the tonsil is removed.

Cases III and IV.

A.B. and E.B. aet. 4 years. These were twin boys and suffered practically since birth from enlargement of the tonsils and adenoids. Their symptoms were singularly alike. They were mouth breathers, frequently suffered from colds in the head and were often subject to excoriations round the mouth and nose. Their speech was characteristic of their condition.

They were operated upon at the same time and the result has been most satisfactory , no return of the con-

dition having occurred although they both have suffered from a severe attack of measles, a malady which might have been expected to set up a fresh growth of adenoid tissue.

Case V.

E.D. a female aet. 16 years. Three years ago this girl suffered from diphtheria, which left a permanent enlargement of the tonsils. As she suffered from frequent attacks of acute tonsillitis subsequently, I enucleated the tonsils and there has been no return of the attacks.

Case VI.

A.F. aet. 8. This girl showed the typical facies associated with enlarged tonsils and adenoids. She was hardly ever free from colds and was beginning to be deaf.

The same result followed operation in this case, a complete freedom from the distressing symptoms being at once observed.

Case VII.

A.B. aet.7. This was a schoolgirl and she hadthe largest tonsils I have ever seen as they met in the middle line and completely obscured a view of the posterior wall of the pharynx. She had a most characteristic

appearance and her voice was practically diagnostic of the condition from which she suffered. A complete removal of the tonsils gave relief to all her symptoms and no further trouble has been experienced.

Case VIII.

R.A. aet. 6. This boy suffered from enlarged tonsils and adenoids in a marked degree. He was a well-marked mouth breather and suffered greatly from night-terrors and disturbed sleep. Here the radical operation acted like a charm and there has been no recurrence of the symptoms.

Case IX.

H.S. aet. 10. This boy had suffered many years from enlarged tonsils and adenoids, the symptoms being greatly aggravated by nocturnal enuresis which made the boy very miserable and nervous. Since operating upon him three years ago I have had frequent opportunities of seeing the lad and find that he has been entirely relieved from the distressing condition.

Case X.

C.H.aet.7. This case is related as a contrast to the proceeding. This boy suffered from very much

enlarged tonsils, which projected into the fauces and tonsillotomy only therefore was performed five years ago. I found a short time ago that the tonsils were quite as much enlarged as ever with all the old symptoms, the result being quite unsatisfactory as the boy continues to suffer from acute tonsillitis. I have therefore recommended that an enucleation of the tonsils be performed at as early a date as possible.

Modern Methods of Treatment.

By all who are brought much in contact with the treatment of enlarged tonsils by tonsillotomy, it must be admitted that the means adopted are far from satisfactory in their results in a great number of cases. A mere section by means of a guillotine through that portion of the diseased gland which projects beyond the pillars of the fauces must obviously leave behind a very considerable part of the tonsil together with the diseased crypts, the result being that subsequent operation is required. The various tonsil punches, etc. on the market to be used as adjuncts to the tonsillotome are eloquent testimony to the inefficiency of this form of treatment. The reintroduction, therefore, of the ancient operation of toncillectomy or enucleation offers a method of dealing with certain classes of hypertrophied tonsils which bids fair to supersede all other methods. One or two features regarding it claimattention. It is so efficient and yet so simple in its performance that almost any one with a knowledge of the anatomy of the parts can readily acquire the necessary skill. The underlying principle is to regard the tonsil not so much from the standpoint of its size but rather its septicity and to aim at its complete removal as in the case of any other lymphatic gland which has become

diseased.

The removal of the whole tonsil is made possible by the fact that the capsule forms the boundary of the gland and is closely attached to it, while for the greater part of its area it is very loosely connected with the muscles forming the pillars of the fauces and the Superior Constrictor of the Pharynx. Advantage of this is taken by the surgeon and various means are adopted to carry it out.

Certain forms of tonsillar disease are especially amenable to this form of treatment :

(1) Those cases where recurrent tonsillitis or quinsy make it obvious that the physiological functions of the tonsils are in abeyance and that the tonsil has become a source of danger from ever-recurring septic invasions.

(2) Cases where the cervical glands are the subject of tubercular infection. The researches of Carmichael (Proc. Roy. Soc. Med. Nov. 1909) and others clearly indicate that the tonsil is frequently the original focus of infection and that the cervical glands are secondarily invaded.

(3) The Buried tonsil is another variety calling for radical operation. Here the gland hardly projects beyond the pillars and it is clear that tonsillotomy cannot meet the requirements of such a case

and that in order to deal properly with it some form of dissection must be carried out.

(4) Then there are those cases of which some mention has already been made, namely the recurrent form in which the hypertrophy shows itself again after operation has already been carried out, the remaining buried portion of the tonsil giving rise to frequent acute attacks of tonsillitis.

To carry out treatment by enucleation numerous means have been adopted and these may be shortly grouped into those in which the finger plays the principal part and those where the primary separation of the faucial pillars - an essential part of the operation - is effected by means of a blunt dissector or a sharp knife of various types. A brief description of these methods will suffice:-

(1) Finger Enucleation (Milligan and Wingrave, Diseases of the Ear, p. 559). By means of the index finger nail the fibrous membrane binding the tonsil to the mucous membrane of the faucial pillars is torn through along the whole length of the isthmus both anteriorly and posteriorly. The tonsil is next pulled forward and gradually stripped from its fibrous bed, the operatinn being completed by dividing the fibrous band at the lower pole by means of scissors, guillotine or snare.

(2) Milligan's Method (Med. Annual, 1911, p. 635). This method may be taken to typify those which are carried out by means of knives. The capsule is here divided completely by means of a right-angled hook-shaped knife inserted under cover of the pillars and swept upward and downward. The gland now only attached to the connective tissue of the Superior Constructor of the Pharynx is shelled out by the finger, guillotine, knife or scissors as occasion may require, care being taken during this procedure to drag the tonsil towards the middle line.

(3) McKenzie's Method (B.M.J., Nov. 19, 1910, p. 1624). A blunt dissector is here used to separate the tonsil for the pillars of the fauces. After the anterior pillar is free the tonsil is seized with a pair of forceps and gently pulled out in order to define its upper attachment. This is cut and the further separation is conducted until the gland is freed all round except at the lower pole which is cut through by scissors, snare, or guillotine.

Some operators have the patient in a more or less sitting position so that they may obtain a better light but usually chloroform is preferred and the patient is placed with the head in the recumbent position with a sandbag placed under the shoulders.

The tonsillar artery is occasionally the cause of some trouble and the haemorrhage may be free but as

the vessels are torn rather than cut they are easily checked as a rule and the bleeding is frequently less free than in the case of tonsillotomy. The application of hydrogen peroxide will usually check the haemorrhage.

The after-treatment to be adopted is the same as for the easier operation, namely, rest in bed in the recumbent position, ice to suck and a mild antiseptic mouth wash or gargle used. Formamint lozenges and a peroxide of hydrogen spray will be found useful.

Several objections have been put forward by the advocates of a less radical operation who insist ~~that~~

(1) That special skill is necessary for the performance of enucleation. To anyone who takes the trouble to acquire the necessary knowledge of the parts this should not prove an insuperable difficulty. Trouble may be experienced - especially in finger enucleation - with cases of soft friable tonsils where the capsule of the tonsil is missed and the result is that only part of the tonsillar tissue is removed and the capsule itself is left. This should not often take place.

(2) That the deeper anaesthesia necessary adds needless danger to the operation. Here the choice of the anaesthetist is probably as important or more so

than that of the anaesthetic. Care should be taken that one experienced in these throat operations should be employed, and as the class of patients are usually young children whose tissues are unimpaired, the risk is not appreciably greater than in the case of tonsillotomy.

Summary and Conclusions.

1. It has been established that the ordinary methods of dealing with enlarged tonsils by means of a guillotine is far from satisfactory and that the operation of enucleation is an efficient operation, which with a little practice can be performed as readily as tonsillotomy. It has the further advantage over the latter that it is an effectual cure for recurrent tonsillitis and quinsy and for this reason it is especially to be recommended to adults who are often subject to this distressing condition.

2. As Tubercle Bacilli are frequently found to gain entrance to the body through the tonsil and thence to the cervical glands, the extirpation of the tonsil does away with this channel of infection.

3. A study of the anatomical relationships of the tonsil will at once dispose of objections sometimes raised that the operation of enucleation should not be practiced on account of the risk of wounding the Internal Carotid Artery. As the artery lies $\frac{5}{8}$ inch away from the capsule of the gland, it should be safe from any but the most energetic operators.

4. Haemorrhage from the tonsillar arteries was long a bugbear but this as a rule can be readily checked by pressure.

5. It has been further objected that this opera-

tion may impair the voice as a result of the contraction of cicatricial tissue impeding the muscles of the pharynx. In professional singers and those who depend upon their voice for their living, this objection might be of importance, and we should therefore be cautious in recommending such to undergo the operation.

6. The faucial pillars are said to be sometimes torn during the operation but good light and the exercise of ordinary care should render this accident an impossibility.

7. In conclusion we have in enucleation an operation which fulfils two very important requirements in that it combines efficiency with simplicity while at the same time it ensures a thorough removal of all the dead tissue - a condition which has long caused surgeons to feel dissatisfaction with the results of tonsillotomy.

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